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Heart Failure and Cardiomyopathies

STATINS AND EXERCISE TRAINING RESPONSE IN HEART FAILURE PATIENTS: INSIGHTS FROM THE HF-ACTION TRIAL

Poster Contributions
Poster Hall B1
Saturday, March 14, 2015, 3:45 p.m.-4:30 p.m.

Session Title: Advances in Heart Failure Therapies: From Diuretics to VADs and Transplant
Abstract Category: 14. Heart Failure and Cardiomyopathies: Clinical
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Background: Recent data suggest that statins may attenuate exercise training (ET) response, but limited data exist in patients with heart failure (HF), many of whom use statins.

Methods: HF-ACTION was a randomized, controlled (usual care vs ET) trial of 2,331 chronic ambulatory HF patients with ejection fraction ≤ 35%. We evaluated whether there was a treatment interaction between statins and ET response measured by peak oxygen consumption (VO2) and 6-minute walk distance (6MWD) from baseline to 3 months. Multiple regression analyses were performed for each endpoint, adjusting for baseline measures and previously identified HF-ACTION risk model covariates. We also assessed for a differential treatment interaction between atorvastatin, simvastatin, pravastatin and ET.

Results: Of 1,353 patients in HF-ACTION with documented statin use, 670 (49.5%) were randomized to ET and 683 (50.5%) to usual care. Patients treated with statins were more likely to be older men with hypertension, ischemic etiology, elevated BUN and lower heart rate. Patients randomized to ET vs usual care had a larger increase in peak VO2 (0.6 vs 0.2 ml/kg/min, p<0.001) and 6MWD (20 vs 5 m, p 0.05) (Table).

Conclusion: In this large trial of ET in patients with chronic HF, there was no evidence of an interaction between statin use and short-term change in exercise capacity.

Table. Statins and Changes in Exercise Capacity

Variable	Statin Use	Randomized Treatment Group	Baseline N	Baseline Median (IQR)	3 Month N	3 Month Median (IQR)	Change Baseline – 3 months N	Change Baseline – 3 months Median (IQR)	Adjusted* P-value for statin interaction
Peak VO_2 (mL/kg/min)	No Statin	Usual Care (N=489)	481	14.8 (11.8, 18.5)	367	15.8 (12.6, 19.4)	367	0.2 (-1.2, 1.6)	0.45
		Exercise Training (N=489)	484	14.7 (11.6, 17.8)	416	15.6 (12.4, 19.1)	416	0.6 (-0.8, 2.4)	
	Statin	Usual Care (N=683)	662	14.4 (11.4, 17.3)	531	14.2 (11.7, 17.7)	531	0.2 (-1.1, 1.3)	
		Exercise Training (N=670)	648	14.1 (11.2, 17.4)	556	15.4 (12.1, 18.4)	556	0.6 (-0.7, 2.2)	
6MWD (meters)	No Statin	Usual Care (N=489)	479	381 (305, 441)	360	388 (320, 464)	358	0 (-32, 37)	0.27
		Exercise Training (N=489)	478	370 (300, 439)	404	400 (321, 460)	402	24 (-14, 64)	
	Statin	Usual Care (N=683)	667	366 (297, 429)	520	369 (291, 433)	516	8 (-27, 38)	
		Exercise Training (N=670)	656	366 (292, 436)	562	393 (315, 457)	559	18 (-17, 50)	

Abbreviations: IQR, indicates interquartile range; VO_2, oxygen uptake; 6MWD, 6 minute walk distance

*Adjusted model for peak VO_2 includes: age, sex, race, income, prior revascularization, ischemic etiology, insulin use at baseline, pacemaker, diastolic blood pressure, body mass index, exercise test duration, $VeVCO_2$ slope, BUN, number of heart failure hospitalizations in prior six months, ACEI, ARB, loop diuretics at baseline. Model also adjusted via propensity weighting for missing exercise capacity measures at 3 months

**The adjusted model for 6MWD includes: age, sex, race, prior revascularization, smoking status, ischemic etiology, NYHA Classification, other diuretics at baseline, digoxin at baseline, systolic and diastolic blood pressure, resting heart rate, LVEF, exercise test heart rate, exercise test duration, exercise test Peak oxygen pulse (mL/kg), exercise test Peak respiratory exchange ratio, BUN, loop diuretic use at baseline, KCCQ clinical summary score at baseline, number of heart failure hospitalizations in prior six months, exercise test peak VO_2